Text Detection

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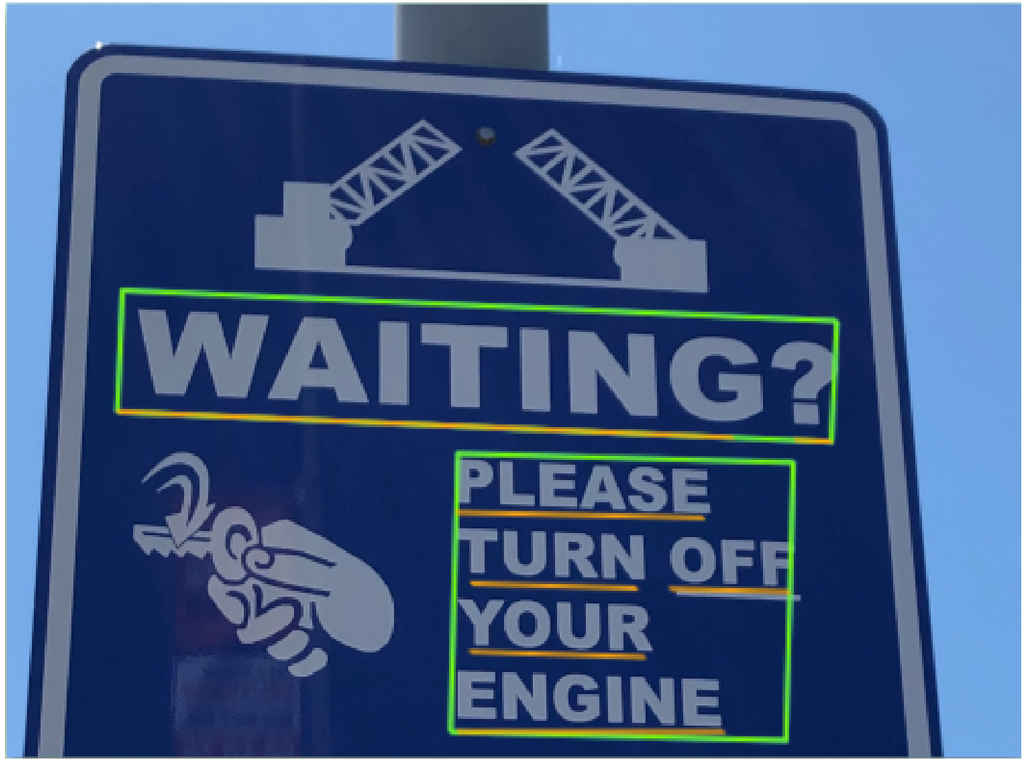
LATAR BELAKANG

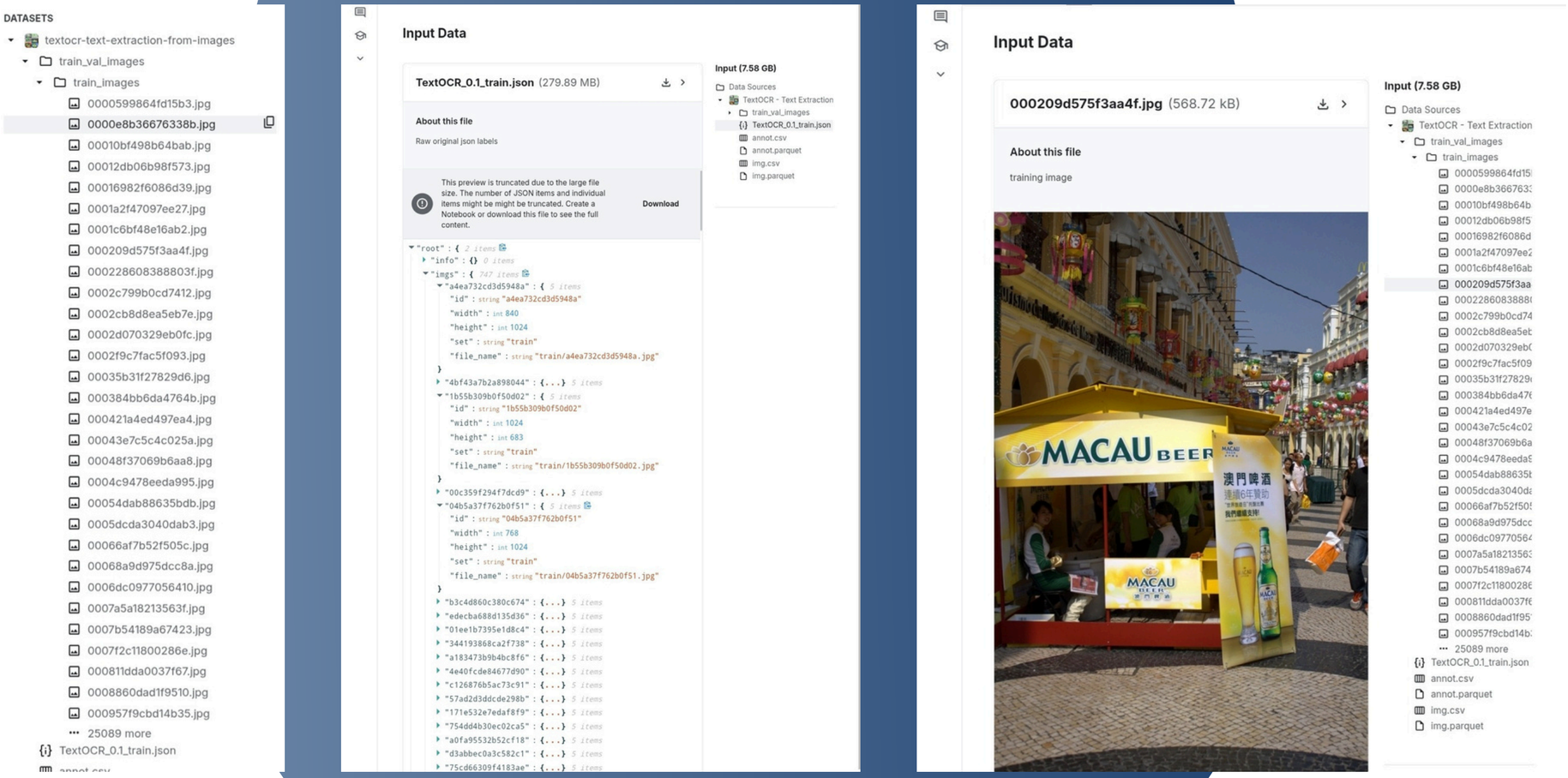
Text Detection

Kelompok kami memilih topik text detection karena teknologi ini merupakan solusi inovatif yang mengatasi berbagai permasalahan krusial di era digital saat ini. Text detection, atau teknologi pendeteksian teks, telah berkembang menjadi komponen penting dalam ekosistem teknologi modern sebagai respons terhadap beberapa tantangan signifikan yang dihadapi masyarakat global.



Dataset

Kelompok kami menggunakan textOCR dataset yang berisi banyak gambar dengan text annotationnya



Contoh Gambar

[8]:

```
fig, ax = plt.subplots(figsize=(10, 10))
ax.imshow(plt.imread(img_fns[20]))
ax.axis('off')
plt.show()
```

+ Code + Markdown

Hasil menjalankan 100 set gambar

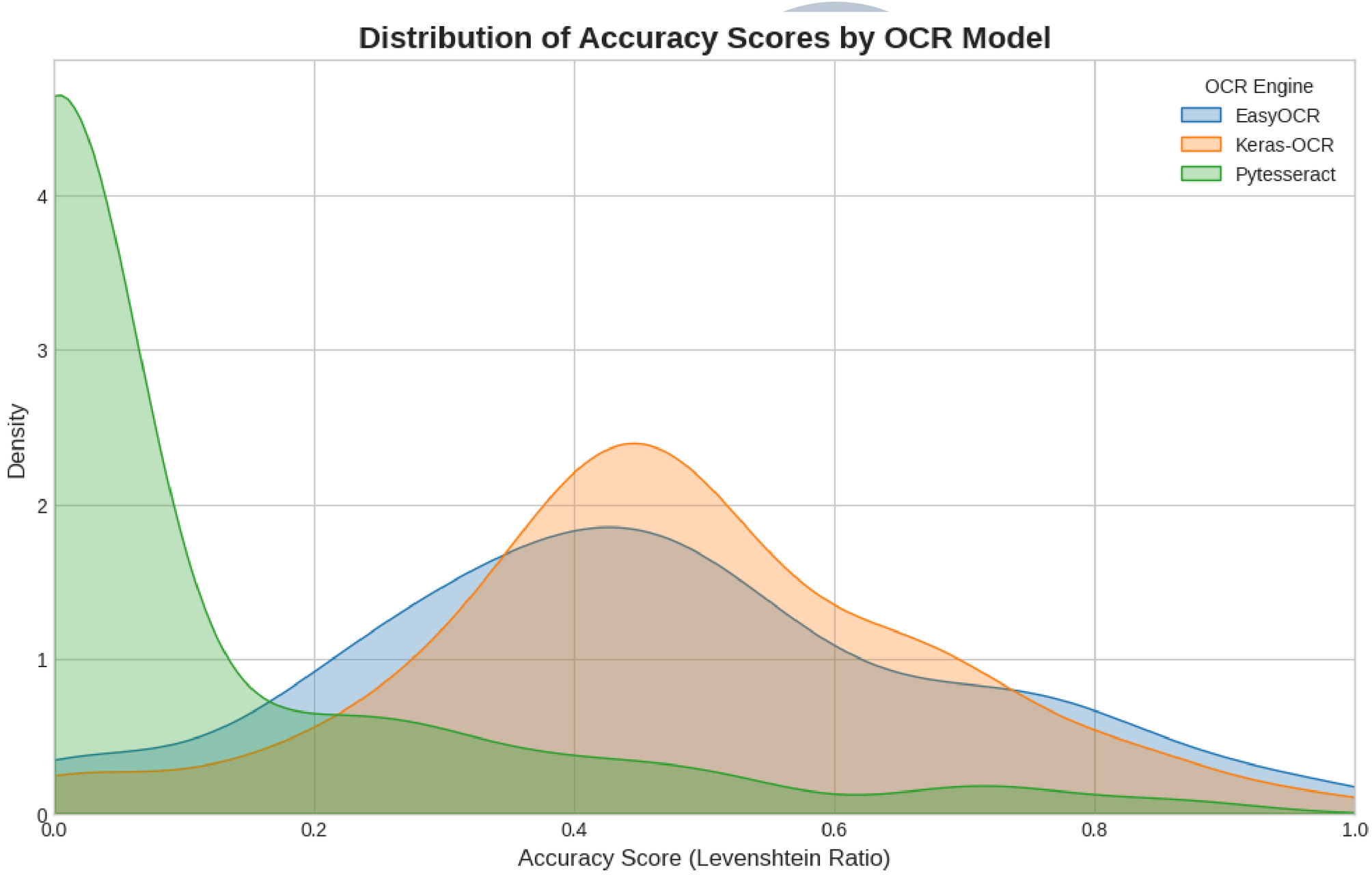
```
Processing Images: 100% ████████████████████ 300/300 [8:04:02<00:00, 89.11s/it]
1/1 [==============================] - 40s 40s/step
1/1 [==============================] - 10s 10s/step
1/1 [==============================] - 45s 45s/step
1/1 [==============================] - 1s 1s/step
```

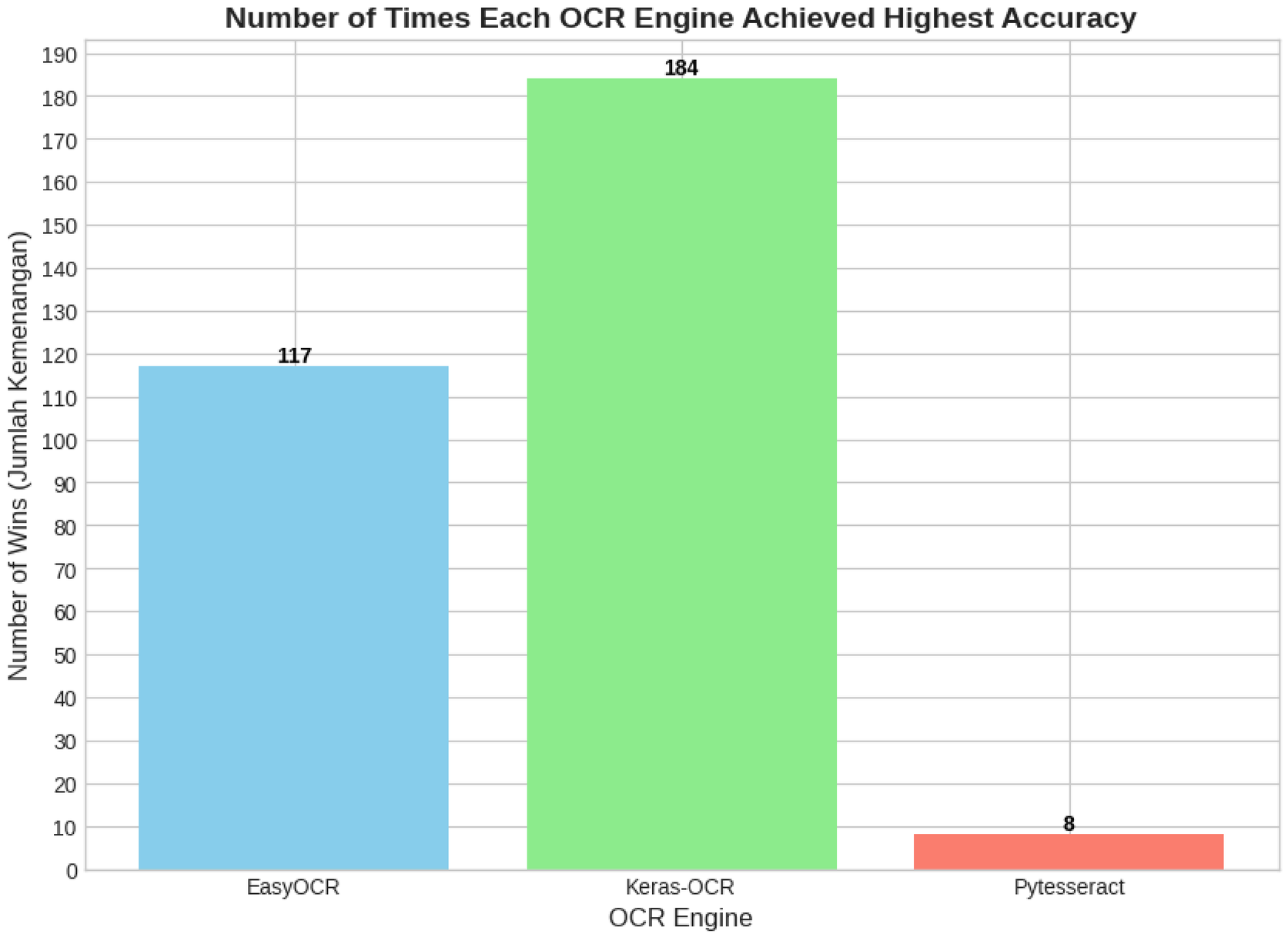
--- Results Preview ---

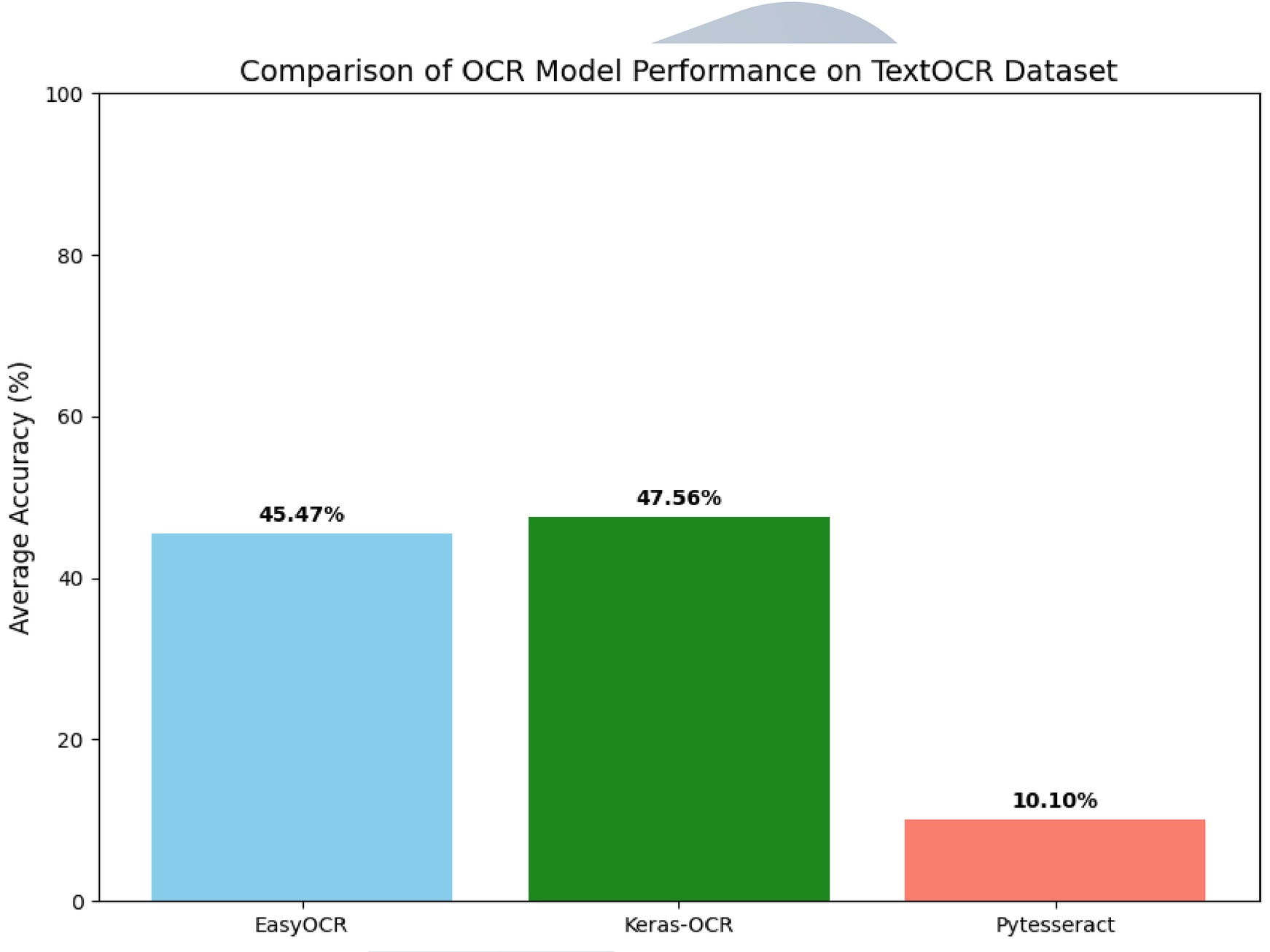
	file_name	ground_truth	easyocr_text	easyocr_accuracy	keras_ocr_text	keras_ocr_accuracy	pytesseract_text	pytesseract_accuracy
0	3a7d196f293b0bf5.jpg	4-9% HATLIFTER STOUT GRAND RIDGE BREWERY VINTAGED NO ADDED CHEMICALS OR PRES...	(ewer ~u5 Most AWARDED 'BREWERY 49" euryA GRAND 9 9 .ko Rewe?) 6 Aunt Aobrd...	0.361775	crans ridge srewer brewery o most awarded wolift g crand ridge ppewev wo tre...	0.412698		0.000000
1	1940f68d6d697475.jpg	Ping Pin LEMON . -So So Pin . Pi S P	LEd Pin PvSe Ord ES	0.338462	dv lemol so p s din	0.400000		0.000000
2	73db6439b8b9aa38.jpg	adidas . . das .	0S odlaas	0.400000	css caigas	0.307692		0.000000
3	01a28309568b4274.jpg	Chan ans 19 TOEWS KANE 88 88	TOEwS 19 8 KINE Ohay|	0.408163	toews 19 o kane cha ans	0.509804		0.000000
4	3b3fb77c202ef6eb.jpg	2nd Edition COMPUTER ALGORITHMS HOROWITZ SAHNI RAJASEKERAN SP AN INTRODUCTIO...	A LGOR T5 COMPUTER Edition ALGORITHMS COvPUTERS AND InTRACTABILITY Guda Kotn...	0.481481	algorts 2nn edition computer computers and intractability guce witing lo ino...	0.466312	CompurTerR\nALGORITHMS\n\nHorowmz + Sauni\nRAJASEKERAN\n\nTrogramming\n\n¥\n...	0.324519

```
--- Average Model Accuracy ---
EasyOCR Average Accuracy:     45.47%
Keras-OCR Average Accuracy:   47.56%
Pytesseract Average Accuracy: 10.10%

Full detailed results have been saved to 'ocr_comparison_results.csv'
You can download this file from the file browser on the left sidebar.
```


Distribution of Accuracy Scores by OCR Model
OCR Engine
EasyOCR
Keras-OCR
Pytesseract
Density
0
1
2
3
4
0.0
0.2
0.4
0.6
0.8
1.0
Accuracy Score (Levenshtein Ratio)


Number of Times Each OCR Engine Achieved Highest Accuracy
Number of Wins (Jumlah Kemenangan)
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
117
184
8
EasyOCR
Keras-OCR
Pytesseract
OCR Engine


Comparison of OCR Model Performance on TextOCR Dataset
Average Accuracy (%)
100
80
60
40
20
0
45.47%
47.56%
10.10%
EasyOCR
Keras-OCR
Pytesseract

Implementasi ResNet dalam EasyOCR

EasyOCR menggunakan ResNet sebagai backbone untuk komponen recognizer
Biasanya menggunakan ResNet-50 yang telah dimodifikasi
Output feature maps dari ResNet diproses oleh:

Bidirectional LSTM untuk sequence modeling
CTC (Connectionist Temporal Classification) untuk decoding

Model dilatih pada dataset besar yang berisi berbagai jenis teks

Keunggulan ResNet dalam Deteksi Teks

Ketahanan terhadap variasi visual (robust feature extraction)
Kemampuan generalisasi yang baik untuk berbagai jenis teks
Pembelajaran hierarkis:

Layer awal: garis, tepi, kurva
Layer tengah: komponen karakter
Layer akhir: representasi karakter lengkap